

Claims

- [c1] 1. A method of photoresist trimming, comprising the steps of:
- forming a resist foot in a trench; and
 - removing the resist foot found in the trench during a trimming process.
- [c2] 2. The method of claim 1, wherein the trimming step comprises ionizing a portion of a mixture of gases comprising O_2 and at least one other oxide gas to form an etchant for the trimming process.
- [c3] 3. The method of claim 2, wherein the mixture of gases comprises any of at least CO_2 , SO_2 and NO_2 formed by mixing during a plasma etching process.
- [c4] 4. The method of claim 2, wherein the trimming process is performed on a mask and an upper surface of the mask is resistant to etching.
- [c5] 5. The method of claim 4, further comprising polymerizing an upper surface of the mask.
- [c6] 6. The method of claim 3, further comprising providing a barrier on an upper surface of the mask derived from an

oxide gas.

- [c7] 7. The method of claim 3, further comprising arranging a carbon barrier on an upper surface of the mask.
- [c8] 8. The method claim 1, further comprising forming a sidewall in a mask which is to be trimmed during the trimming step, and etching a lower portion of the sidewall of the mask using the mixture of gases comprising O_2 and at least one other oxide gas to form the sidewall substantially perpendicular to a surface of the mask.
- [c9] 9. The method of claim 2, wherein the mixture of gases comprising O_2 and at least one other oxide gas in a ratio ranging from about 1:50 to 50:1.
- [c10] 10. The method of claim 2, further comprising forming a mixture of gases comprising O_2 and at least one other oxide gas in a ratio ranging from 1:10 to about 10:1.
- [c11] 11. The method of claim 10, further comprising forming a mixture of gases comprising O_2 and at least one other oxide gas in a ratio ranging from about 1:3.
- [c12] 12. The method of claim 2, further comprising holding the mixture of gases comprising O_2 and at least one other oxide gas at a pressure ranging from about 1 mT to 1000 mT.

- [c13] 13. The method of claim 2, further comprising holding the mixture of gases comprising O_2 and at least one other oxide gas at a pressure ranging from about 1 mT to 100 mT.
- [c14] 14. A method of forming an imaging mask, comprising the steps of:
- arranging an opaque layer on a transparent substrate;
 - arranging a mask material on the opaque layer;
 - imaging the mask with a prescribed pattern; and
 - trimming an etched mask with a trimming gas comprising O_2 and at least one other oxide gas.
- [c15] 15. The method of claim 14, wherein the forming the trimming gas comprises mixing any of at least CO_2 , SO_2 and NO_2 with O_2 in a ratio ranging from about 1:10 to about 10:1.
- [c16] 16. The method of claim 14, wherein the forming the trimming gas comprises mixing O_2 and at least one other oxide gas at a pressure ranging from about 1 mT to 100 mT.
- [c17] 17. The method of claim 14, wherein the imaging step includes the formation of a mask foot at a based of the prescribed pattern and the trimming step includes re-

moval of the mask foot to form substantially perpendicular sidewalls of the prescribed pattern with respect to a surface thereof.

- [c18] 18. A trim gas for etching a mask foot formed at a base of a sidewall pattern, comprising O_2 and at least one other oxide gas comprising at least any one of CO_2 , SO_2 , and NO_2 .
- [c19] 19. The trim gas of claim 18, wherein the O_2 and at least one other oxide gas has a pressure ranging from about 1 mT to 1000 mT.
- [c20] 20. The trim gas of claim 18, wherein the O_2 and at least one other oxide gas is configured to strengthen an upper surface of a photoresist being trimmed.